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The State of the US Public Health Workforce: Ongoing Challenges and Future Directions

Jonathon P. Leider,¹ Valerie A. Yeager,²
Chelsey Kirkland,¹ Heather Krasna,³
Rachel Hare Bork,⁴ and Beth Resnick⁵

¹Center for Public Health Systems, Division of Health Policy and Management, School of Public Health, University of Minnesota, Minneapolis, Minnesota, USA; email: leider@umn.edu

²Department of Health Policy and Management, Richard M. Fairbanks School of Public Health, Indiana University, Indianapolis, Indiana, USA

³Department of Health Policy and Management, Mailman School of Public Health, Columbia University, New York, NY, USA

⁴de Beaumont Foundation, Bethesda, Maryland, USA

⁵Department of Health Policy and Management, Bloomberg School of Public Health, Johns Hopkins University, Baltimore, Maryland, USA

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Keywords

public health workforce, recruitment, retention, workforce development, training, enumeration

Abstract

Between the 2009 Great Recession and the onset of the COVID-19 pandemic, the US state and local governmental public health workforce lost 40,000 jobs. Tens of thousands of workers also left during the pandemic and continue to leave. As governmental health departments are now receiving multimillion-dollar, temporary federal investments to replenish their workforce, this review synthesizes the evidence regarding major challenges that preceded the pandemic and remain now. These include the lack of the field's ability to readily enumerate and define the governmental public health workforce as well as challenges with the recruitment and retention of public health workers. This review finds that many workforce-related challenges identified more than 20 years ago persist in the field today. Thus, it is critical that we look back to be able to then move forward to successfully rebuild the workforce and assure adequate capacity to protect the public's health and respond to public health emergencies.

INTRODUCTION

Public health in the United States has too often operated on a cycle of “neglect, panic, repeat” where an event prompts increased attention and funding, the response occurs, and then, as the event wanes, policy makers and the public turn their attention to other matters and funding declines until the next notable event (52). These peaks and valleys of interest and funding are the steady state that the public health workforce endures, a state that began a century ago and continues still. Although the context in which public health operates has evolved considerably, it has evolved alongside a public health education system that has not been entirely responsive in kind to the needs of the public health practice community (90).

In the seminal 1915 Welch–Rose report, a vision for a national public health education system was outlined for the United States. It would make public health schools distinct but coequal with medical schools and align public health and medicine for high collaboration (96, 111). However, in the 1930s, medical care advocacy groups moved most of their funding toward hospital investment rather than toward public health (51). This action set the stage for underinvestment in public health and, subsequently, the public health workforce. While the Public Health Service Act of 1944 provided a legislative base for public health services in the United States (109), the public health system and its workforce have since received relatively modest investment (75). In addition, siloing funds programmatically within public health and across government has created substantial capacity constraints and barriers to cross-sector collaboration (38). The landmark 1988 Institute of Medicine (IOM, now the National Academies of Sciences, Engineering, and Medicine) report outlined a modern collaborative vision for public health, one that would move health departments away from clinical care provision and toward population-based prevention and inspection/regulatory services (51). A major shift in the workforce was expected to follow. While a partial divestment from clinical services did follow, as did the sense of a general decline in size of the workforce, long-standing challenges persisted in actually enumerating the workforce, which yielded different estimates based on different definitions and taxonomies of who constituted the public health workforce (49, 97).

In the time between the IOM 1988 and 2003 reports, state and local governments turned increasingly to the private sector (often managed care organizations) to provide health care services for Medicaid beneficiaries. In addition, more people were moving to employer-provided private health insurance, which decreased the need for direct health care services at local health departments (LHDs) and would, scholars (and an assistant surgeon general in the 1970s) thought, allow public health agencies to shift their focus from providing personal health care services to other neglected population-based public health functions (41). However, revenue provided by services to Medicaid patients often subsidized the population health programs of governmental public health agencies (49), and so shifting health care services away from LHDs ended up reducing essential funding and had the unintended consequence of negatively impacting public health agency capacity to drive population health and public health (49).

Despite the growing mindset over the past several decades that the federal government has a financial responsibility (50) for assuring the capacity of public health infrastructure (which fundamentally includes its workforce), equivalent levels of investment for medical care and biomedical research have not been provided for public health (50). In 2004, one of the first reviews of the public health workforce was published in the *Annual Review of Public Health* (97). Tilson & Gebbie (97) characterized the unprecedented challenges for public health and subsequent need for substantial investments in public health infrastructure, which they believed “will be for naught if the fundamental building block, the public health worker, cannot be guaranteed to be the strongest link” (p. 355). Yet, the next decade saw more cycles of feast-and-famine funding for public health and its workforce (103). The aftermath of the Great Recession saw one-fifth of the

public health workforce quit, retire, or get laid off (60). As such, the public health workforce lost at least 40,000 jobs between 2010 and 2013 and largely has not yet recovered, even peri-COVID (42, 60). Notably, employment across the public sector lost millions of jobs but did recover (47), highlighting some important distinctions between public-sector employment and that of the public health workforce specifically.

Since Tilson & Gebbie's 2004 workforce review (97), two other large-scale reviews were conducted (8, 46). Focusing on the state of the public health workforce in the 25 years since the 1988 IOM report, Hilliard & Boulton (46) identified four urgent priorities for the public health workforce: (a) diversity; (b) recruitment, retention, separation, and retirement; (c) education, training, and credentialing; and (d) pay, promotion, performance, and job satisfaction. In another study published the same year, Beck & Boulton (8) reported limited empirical research directly examining workforce issues despite repeated calls for it. Without such evidence, they argued, addressing public health workforce issues would continue to be difficult. Since 2012, substantial research on the public health workforce has been conducted and published. This article provides, first, an overview of what is known about the public health workforce regarding enumeration, pathway development, and recruitment and retention, and, second, summarizes current knowledge gaps and highlights future workforce research needs.

COMPOSITION AND ENUMERATION

Fundamental questions about the composition of the workforce and how many public health staff work at the federal, state, and local levels have long plagued the field (78). Gebbie and colleagues' (37) findings from 2009, which highlighted the decline in the size of the workforce since the 1970s, were largely contingent on which definitions were used. Ultimately, the challenges of accurately characterizing and enumerating the workforce relate to public health's nature as a broad and fragmented field, rather than a clearly defined discipline, and to the fact that federal entities do not track all the different types of public health workers (e.g., community health workers, environmentalists, disease intervention specialists) (36). Although the Bureau of Labor Statistics tracks how many and what type of workers exist for many occupations and industries, e.g., dentists across the United States (100), no such measures exist for governmental public health, leaving such endeavors largely to the nonprofit and private sectors (46).

Beck and colleagues' (9) enumeration in 2014 again attempted to count the number of public health workers, also finding the data to be lacking. They used six data sources, including profile survey data from both the Association of State and Territorial Health Officials (ASTHO) and the National Association of County and City Health Officials (NACCHO), data from the Office of Personnel Management, and individual assessments from discipline-specific public health member organizations. Their composite concluded that ~300,000 people (uncertainty range 231,000–341,000) worked in governmental public health in the United States, with 50% (147,000) at the local level, 30% (81,000) at the state level, and 20% (53,000) at the federal level. Similar conclusions were drawn from the de Beaumont Foundation and Public Health National Center for Innovations (PHNCI)'s nationally oriented Staffing Up project in 2022 (25), which estimated a local workforce of 152,000 and a state central office workforce of 54,000 in 2019, with incongruities in state-level estimates plausibly associated with the double counting of some state-employed staff who work in local or regional health departments (26).

One significant development in public health workforce research, including composition and enumeration, occurred with the advent of the Public Health Workforce Interests and Needs Survey (PH WINS). PH WINS was fielded in 2014 ($n = 23,229$ responses), 2017 ($n = 47,606$ responses), and 2021 ($n = 42,929$ responses) by the de Beaumont Foundation, in collaboration with ASTHO (all years) and NACCHO (2014 and 2017 only). Created in

Table 1 Demographics of the public health workforce in 2014 versus 2017 and 2021

	State health agency–central office			Big city health departments		Other local health departments		All health departments	
Demographics	2014	2017	2021	2017	2021	2017	2021	2017	2021
Age									
≤35	18%	19%	22% ^{**}	24%	26%	21%	25% ^{**}	21%	25% ^{***}
36–64	77%	76%	72% ^{***}	71%	69%	73%	69%	73%	70% ^{**}
65+	5%	5%	6% [*]	5%	5%	6%	6%	5%	6%
Highest degree attained									
Bachelor's or higher	76%	74% ^{††}	80% ^{***}	74%	81% ^{***}	62%	66%	67%	74% ^{**}
Gender									
Man	28%	27%	22% ^{***}	24%	22%	17%	17%	21%	20%
Woman	72%	72%	76% ^{***}	75%	76%	82%	82%	78%	79%
Other designation	0%	1% ^{†††}	2% ^{***}	1%	2% ^{**}	0%	2% ^{***}	1%	2% ^{***}
Public health degree attained (any level)									
Yes	18%	19% [†]	17% ^{**}	19%	19%	9%	9%	14%	14%
Race/ethnicity									
American Indian or Alaska Native	0%	0%	1% ^{***}	0%	1% ^{**}	0%	1% ^{**}	0%	1% ^{***}
Asian	4%	7% ^{†††}	7%	13%	15%	3%	4% [*]	5%	7% [*]
Black or African American	14%	14%	11% ^{***}	23%	23%	15%	14%	16%	15%
Hispanic or Latino	7%	9% ^{†††}	11% ^{***}	25%	23%	12%	20% ^{**}	13%	18% ^{**}
Native Hawaiian or Pacific Islander	0%	1% [†]	0%	1%	1%	0%	0%	0%	0%
Two or more races	5%	6% ^{††}	4% ^{***}	7%	5% ^{**}	7%	4% ^{***}	6%	4% ^{***}
White	70%	64% ^{†††}	65% [*]	32%	32%	64%	57% ^{**}	59%	54% [*]

Note: Statistically significant at ^{***} $p < 0.0001$, ^{**} $p < 0.01$, ^{*} $p < 0.05$ between 2017 and 2021. Statistically significant at [†] $p < 0.0001$, ^{††} $p < 0.01$, ^{†††} $p < 0.05$ between 2014 and 2017.

2013 to characterize the needs of both the field and its staff (63), PH WINS now serves as a major source of information on individual-level public health staff needs, workplace perceptions, and workforce demographics (**Table 1**). In the enumeration space, PH WINS has been used to complement ASTHO- and NACCHO-specific estimates of how much staff (**Figure 1**), of what type, work at which levels of government (63, 67), to characterize educational attainment of the workforce (65), and to examine workforce diversity (22, 112). In addition, the Federal Employee Viewpoint Survey (FEVS) offers comparable insight into the federal workforce, although there is limited public access to demographic information associated with FEVS responses (<https://home.treasury.gov/about/careers-at-treasury/2021-federal-employee-viewpoint-survey-results>). Similarly, FedScope has been used for federal workforce surveillance efforts (1). Administrative data available through Public Health TRAIN, a large learning management system, have previously been used to examine worker characteristics among ~11,000 trainees, as well as factors related to recruitment and retention of public health workers (116, 117).

In the context of composition and enumeration, the recent decade can be characterized by significant public health job losses after the Great Recession in 2008 (60), followed by marked, temporary, increases in the governmental public health workforce during the COVID-19 pandemic response (80). The Biden administration and others have called for a substantial increase in the workforce (105), but questions remain about how or if a surge in temporary workers can translate into a sustained growth in the permanent public health workforce (69).

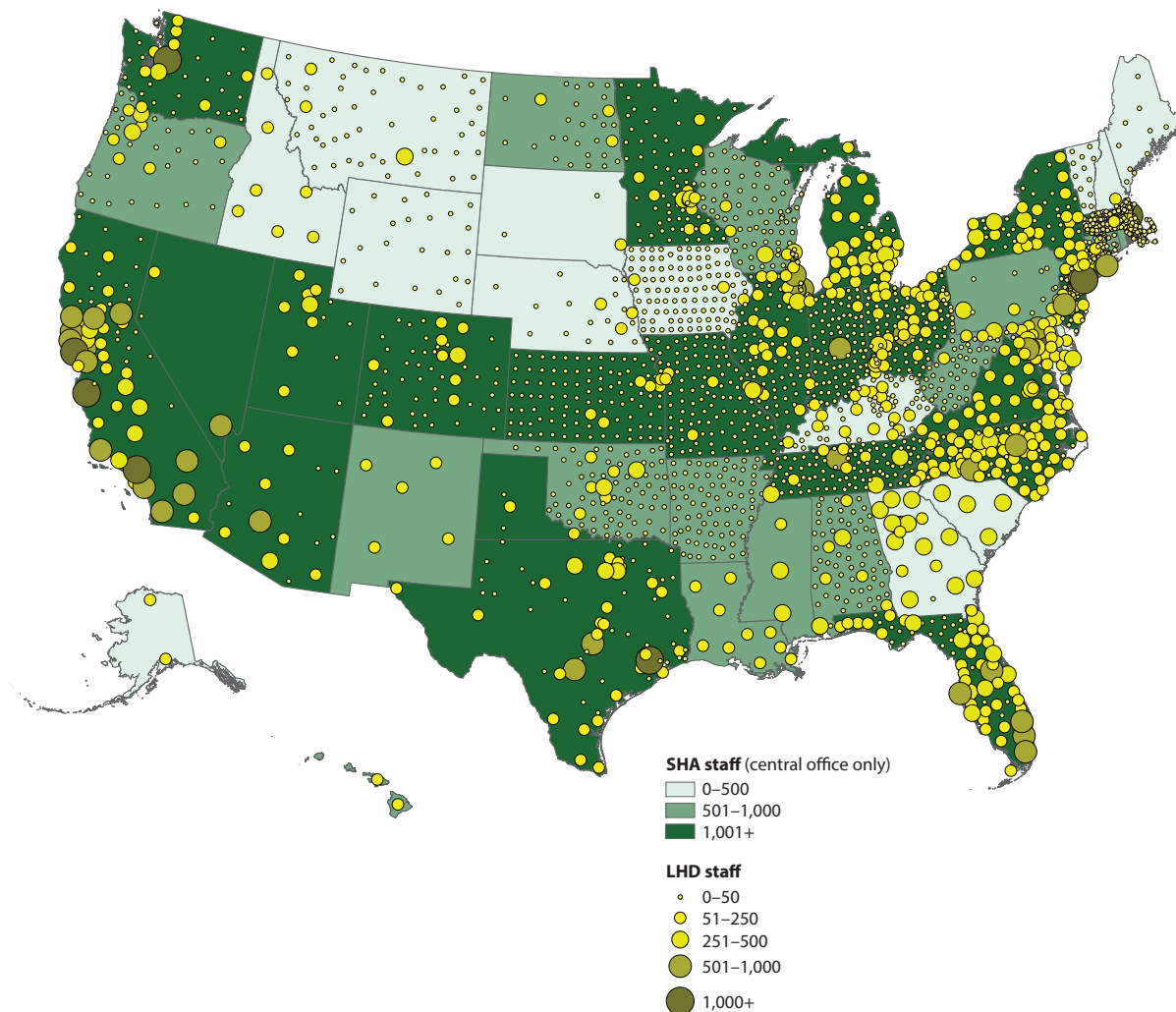


Figure 1

Size of the state and local governmental public health workforce, 2021. Data from author analysis of ASTHO and NACCHO profiles and PH WINS 2021. Territorial and tribal health departments are not shown. Abbreviations: ASTHO, Association of State and Territorial Health Officials; LHD, local health department; NACCHO, National Association of County and City Health Officials; PH WINS, Public Health Workforce Interests and Needs Survey; SHA, state health agency.

PATHWAY DEVELOPMENT

Ensuring that public health agencies have a sufficient workforce requires pathways for trainees to enter the field (pathways have sometimes historically been referred to as pipelines or pipeline programs) (48, 69, 73, 113). The early 2000s offered potential for enhanced pathway development as a result of the 2003 IOM call for undergraduate education in public health, the 2005 establishment of the National Board of Public Health Examiners (NBPHE), and the 2008 launch of the Certified in Public Health credential to demonstrate mastery in public health. However, pathway development has a number of ongoing challenges, including slow and cumbersome hiring processes and relatively low compensation in government positions compared to the private sector

(113). This lower compensation is further exacerbated by rising tuitions and increasing student loan debt, which may influence where graduates can afford to work (57, 83).

In 2020, undergraduate public health degrees eclipsed master's degrees as the most-awarded public health degree, theoretically providing an expanded pathway for the governmental public health workforce (64). However, employment outcomes have shown that only a small percentage of the governmental public health employees—even among new entrants—have either a bachelor's or a master's degree in public health (65, 87). More specifically, data from the 2021 PH WINS showed that only 14% of the workforce had a degree in public health at any level, which remains unchanged since 2017 (42). Another recent analysis indicated that only 10% of undergraduates who received public health degrees in 2015–2018 reported working at governmental agencies (65, 87).

According to 2015–2018 data from the Association of Schools and Programs of Public Health (ASPPH), the majority of graduates with baccalaureate degrees in a public health discipline took their first jobs in for-profit organizations (38%) and health care (27%), with academic institutions (10%) and government (10%) making up only one-fifth of the job placements (87). Master's degree graduates' first employment outcomes over this same time period were similar, with the majority of graduates working in health care organizations (29%) and for-profit corporations (21%); however, master's graduates had almost double the percent of undergraduates employed in government agencies (19%) and academic institutions (18%) (87). Despite that a higher proportion of master's graduates are taking jobs in governmental agencies, a 2015 study by Hemans-Henry and colleagues (45) found that both managers and master's graduates working in governmental public health feel that there remain skills that they could be better prepared to perform. These skills were similar to the training needs identified in PH WINS and generally include management and contracting; quantitative data analysis; and writing that spans literature syntheses, publications, and grant proposals (14, 74).

Diversity

The growth of the undergraduate degree was heralded as a mechanism to diversify the public health pipeline (30). Public health tends to be an appealing major for underrepresented minority (URM) students (54% in public health versus 41% overall) (68, 85), and undergraduate programs in public health overall have more racial/ethnic diversity than do graduate programs (64, 79, 81), although faculty tend not to be racially and ethnically representative of the students they teach (39). Both points are particularly important, given that diversity in the US population continues to increase. In fact, the 2020 US Census measured an increasingly multiracial and diverse population (7), with more than 4 in 10 Americans self-identifying as a race or ethnicity other than non-Hispanic white and more than half of the nation's population under age 16 identifying as a racial or ethnic minority (34). Despite increasing population diversity overall, diversity within the public health workforce has generally been lower than that of the US population, which, according to data from ASTHO, NACCHO, and PH WINS, translates to a workforce in individual communities that does not fairly represent the populations they serve (22).

Certified in Public Health

The Certified in Public Health (CPH) credential was launched in 2008 and overseen by the NBPHE to distinguish public health professionals that demonstrated mastery across core public health content areas (<https://www.nbphe.org/>). The aim for the CPH credential, similar to that of other credentials in applied health fields such as nursing, was to create consistency in skills across the field, raise the standards for hiring public health professionals, and improve salaries and interest in the field of public health. While there have been efforts to expand use of the CPH

credential as well as a job task analysis in 2014 to refine the exam to better align with the needs of the field (61), uptake of and documented requirements for the credential from employers have not occurred as intended. A number of factors have stymied the impact of the CPH, particularly within governmental public health. Among the 44,000 graduate students enrolled in a public health degree in 2020, fewer than 1,000 took the CPH exam (17). Cost of the exam has been documented as a barrier for uptake and maintenance of the exam (17). Anecdotally, other factors noted as potential barriers include the civil service hiring process and limited budgets, as well as eligibility criteria for the exam. Eligibility for the CPH credential initially required a master's degree in public health. As many employees in the public health governmental workforce lack formal public health training, the educational requirement created some discord within the field. To address this discrepancy, in 2016 the NBPHE expanded eligibility to include individuals with at least 5 years of public health work experience along with a bachelor's degree in any concentration. In addition, the cost of the exam (more than \$300) was a barrier for many graduating students. The cost of the exam as a barrier was further exacerbated by the lack of evidence that the CPH credential influenced hiring decisions in private or public settings. From the perspective of government agencies, bureaucratic and lengthy hiring processes and an inability to increase salaries may have hindered the use of the CPH credential as a criterion for hiring. Last, CPH recertification, which is required every 2 years along with the requisite 50 continuing education credits and a \$95 fee, has also lagged. Almost half of CPH-credentialed individuals have allowed their certification to lapse (16).

An Uptick in Applications, With Regression to Follow?

Efforts to expand and diversify pathways for public health are notable, although a number of challenges remain. In fact, pathway concerns became abundantly clear during the COVID-19 pandemic due to the ongoing loss of public health workers (6), rising health inequities, and the dire need for high-level data analysis, epidemiology, communications, and community engagement skills. There was a notable 23% uptick in applications for public health graduate degree programs (from fall 2019 to 2020) most likely associated with the pandemic; however, it is unclear if this increase will be sustained over the long term. Early signs indicate that at least master's programs will begin to again contract to prepandemic levels, which may present substantial long-term challenges to academic public health (54, 86). Perhaps more importantly, given past pathway-to-employment outcomes, it is not clear that an enrollment increase would translate into an influx of employees joining the governmental public health workforce.

RECRUITMENT

While pathway development is crucial in public health workforce development, it is not, by itself, sufficient to assure a robust public health workforce. A mismatch between the supply of trained candidates for public health roles and the unmet needs of the workforce can exist if individuals with the training to work in health departments are not ending up working in the agencies (113). This misalignment could exist due to factors such as lower wages, poorer working conditions, lack of advancement opportunities, or challenges in the hiring process itself (101). It is especially important to understand the factors that influence individuals' career choices when assessing particular occupations for which there is a high degree of labor market competition from the private sector.

Factors Impacting Recruitment into Public Health Departments

Analysis of the factors that attract qualified candidates to seek employment in government health departments has focused primarily on analyses of surveys of individuals who already work in this

setting, finding that job security and competitive benefits were key motivators for candidates to pursue careers in government health departments (117). Salary was found to be a less important motivator for those already working in government. Research examining the factors that enticed workers to leave other sectors and enter the government workforce found that those who had previously worked in health care were influenced by public health's mission, flexible work schedules, and/or employee empowerment (116). Those coming from the private sector in general were influenced by job security and benefits in public health. Recruitment factors also differ by occupation. For example, nurses entering public health have reported to be motivated more by flexible work schedules, employee empowerment, ability to innovate, specific duties, and identification with the mission of the organization than by other recruitment and retention factors (115).

While some studies have examined employment outcomes of public health graduates (58), the factors influencing these outcomes have not been as heavily studied. Researchers have conducted two recent studies of public health students' perceptions of governmental public health careers, including a 2017 survey and a series of focus groups conducted between November 2019 and February 2020 (72, 114). The survey found that although 55% of graduates sought government employment and that job security, competitive benefits, identification with the mission, and opportunities for training attracted candidates to governmental public health, only 17% actually obtained governmental public health jobs (114). Respondents reported that it was difficult to find or understand government job descriptions and navigate the hiring process. One study of bachelor's-level nursing students' intentions to join public health indicated that experience in a public health setting positively impacted students' views of the field, with students being especially attracted by comparable wages, flexible scheduling, and tuition reimbursement (62). Future research on the job-seeker perspective should include qualitative studies of candidate experience in navigating the hiring/recruitment process. Given that the vast majority of the existing studies of what influences recruitment are limited by accessing only those individuals who have selected a job in governmental public health, broader surveys of potential candidates and what influences their career outcomes are needed.

Public Health Recruitment Efforts and Programs

Challenges in recruiting staff into the public health workforce have been noted since at least 1949 (18). A survey conducted by NACCHO in 2012 found that 59% of LHDs were very or extremely concerned about recruitment. This concern is compounded because health departments generally lack resources to conduct recruiting efforts and because few have formal succession plans in place (23). An assessment in 2014 by ASTHO noted that state agencies were actively recruiting for only 28% of vacant positions (5, 55). New research to assess the proportion of vacancies that remain unposted or unfilled and insights from hiring managers could illuminate the challenges that health departments may encounter in recruiting. Barriers could include obtaining approval from civil service authorities or elected officials/city councils to post or fill open positions. A 2012 study found that state health departments identified pay scales and difficulties with salary competition, hiring freezes, a lack of career advancement opportunities, and merit-based raise restrictions as key recruitment barriers for hiring epidemiologists (10). Market competition has also been reported as a hiring barrier for health educators (21).

Several efforts have been made to create hiring pathways into the public health workforce. Many of these, ranging from Morehouse College's Project Imhotep (<https://morehouse.edu/about/services-and-administration/academic-affairs/centers-and-institutes/public-health-sciences-institute/project-imhotep-program>), the 2022-initiated Public Health

AmeriCorps program (3), and the CDC's Epidemic Intelligence Service (EIS; <https://www.cdc.gov/eis/index.html>), among others, rely on internship or fellowship models of term-limited appointments. Some of these models explicitly include opportunities for participants to convert to permanent hires, while others have a stated goal of exposing potential new hires to the public health field in hopes of possibly retaining them in the field. Studies of the longer-running programs generally find that ~60% of participants remain in governmental public health after 3 years [e.g., CDC's Public Health Associate Program (PHAP; 1,650 participants since 2007), the EIS (3,900 participants since 1951), and the Council of State and Territorial Epidemiologists Applied Epidemiology Fellowship program] (19, 20, 27, 77, 108).

While significant efforts have been made to better connect students with the public health workforce through Academic Health Departments, expressly structuring such partnerships as recruitment efforts has not been a major focus (31, 32). Also, while accredited graduate schools and programs of public health require students to take part in an applied practice experience or internship, partly with a goal of connecting students with the public health workforce, research examining the impact of internships on employment in public health is lacking. One epidemiology-focused service learning program in North Carolina governmental public health showed promise as a recruitment tool, but more research about the value of and ways to improve internships is needed (48). Robust mentoring structures have also been noted as especially important in recruitment and retention of younger workers who are entering government health departments where the current staff are generally older than that of other workforces (110). However, like other sectors, public health agencies likely need to tailor recruitment efforts to align with the preferences of younger generations (e.g., remote work expectations), despite that these expectations might not be easy to meet within less flexible cultural and governmental structures (2).

While student loan repayment or forgiveness programs have been used effectively to fill workforce gaps in health care shortage areas since 1972 through the National Health Service Corps program, no comparably robust loan repayment programs for public health students are funded as of this writing. New federal legislation for a public health local repayment program is currently under review (82). Two prior laws (the Affordable Care Act of 2010 and the Pandemic and All-Hazards Preparedness Act of 2006) both contained provisions for loan repayment for public health graduates; however, neither was funded (4, 37). President Biden's administration has worked to improve the Public Service Loan Forgiveness program, which encourages employment in government or nonprofits with loan forgiveness at 10 years of public service (33) (42 U.S.C. § 295f-1).

Labor Market Competition

While hiring into public health agencies faces challenges ranging from a slow and bureaucratic hiring process to lower salaries, other sectors that do not have the same regulatory limitations are hiring candidates with the same skills and training needed by health departments. For example, an analysis of a data set of more than 49,300 job postings for which employers sought candidates with master's-level public health training showed a significant increase in hiring by pharmaceutical firms and health insurance companies during the COVID-19 period of March 2020 through October 2020 as compared to the same time frame a year earlier (56). Additionally, public health graduates from ASPPH member schools are being hired by hospitals, corporations, and nonprofits at higher rates than by government agencies (87). An analysis conducted by Columbia University's Mailman School of Public Health found that hiring of their graduates by for-profit corporations increased every year for five years from 2012 to 2016, while hiring by government remained flat during the same period (59). This increased labor market competition for staff with public health skills may be related to the Affordable Care Act provisions, which encouraged a wider focus on

population health across health care organizations and related industries. In addition, competition for public health laboratorians—as well as for nurses and statisticians, two of the fastest-growing occupations in the United States—is of particular note (95, 99). Competition from other sectors combined with lower salaries, longer hiring processes, complex civil service regulations, lack of widespread access to loan repayment, and lack of resources to design and implement effective recruiting campaigns all likely contribute to ongoing recruitment issues and the general lack of diversity in the governmental public health workforce (76). This is a common challenge to the public sector in general (71), but it is made more profound because public health competes with one of the most remunerative industries—health care—and because of the profound burnout associated with recent pandemic response activities (42, 93).

RETENTION

Job Satisfaction and Intention to Leave

Employee turnover has long been a focus in public health systems research and the broader discourse around public health practice (10, 28, 46). Prior to the Great Recession, scholars and practitioners already expressed concern about a pending diminished workforce resulting from its graying and impending generational shifts associated with mass retirements of the baby boomers, as well as the sequelae of underfunding of public health (28, 91, 94). The crush of retirements was compounded by an increasing trend, pre-COVID-19, of involuntary separations for reasons outside of retirement (i.e., quitting). Analyses of data from PH WINS indicated conformity to broader turnover research, which had long shown that dissatisfaction with pay and with one's supervisor or agency and a lack of employee engagement were associated with higher intent to leave and actual separations (43, 44, 66, 70, 88).

Studies of leadership retention and turnover grew during the last decade, in part due to the State Health Official Career Achievement and Sustainability Evaluation (SHO-CASE) study (89). General findings from that body of work showed that leaders of state health agencies (SHAs) have a median tenure of 3–4 years in office and that having a management or a law degree was significantly related to shorter tenures (40, 89). In addition, states in the top quartile of health rankings had state health officials (SHOs) with significantly longer tenure, highlighting the relationship between leadership consistency and health of the population. Given that leaders set agency priorities, turnover has implications for employee satisfaction and retention as well.

Leadership turnover received renewed attention again in the context of the COVID-19 pandemic, politicization of public health responses, targeted harassment of agency leaders, and reports of both voluntary and nonvoluntary departures (102). Public health officials and their staff who normally work in relative anonymity behind the scenes were thrust onto center stage by the COVID-19 pandemic. The challenges and anxiety over the pandemic's economic and social consequences coupled with growing hostility toward evidence-based thinking and science have led to both public and political pushback on governmental public health officials through increasing criticism and rollback of public health authority along with harassment and personal threats toward the state and local public health workforce and also, at times, their family members (102). Although there has been media and congressional attention to the threatening and harassment of the public health workforce, it has not resulted in any coordinated national action to protect and support the workforce, despite that these incidents have increased public health worker stress, job dissatisfaction, mental distress, and accelerated departures from the field (6, 15, 98, 103).

Diversity in the Context of Employee Retention

Research has shown that URM staff, especially younger URM staff, are among the most likely to indicate that they are dissatisfied with their jobs at state health departments and LHDs and that

their managers are not adequately culturally competent (70, 93). One notable exception to this finding is within big-city LHDs, which are more diverse overall, including within management (70, 93). Disparities in earnings and representation in management have been observed between white and URM staff in public health departments (70, 93). Scholars and practitioners have suggested that concerted efforts to diversify the workforce will need to include improvement in pay and management parity, improvements to workplace conditions and supports, and designated pathways for URM staff from institutes of higher education (22, 29).

Succession Planning

Even in a retentive environment, staff will continue to quit and retire. A focus on succession planning and the planned transfer of institutional knowledge is one way to preserve stability in an organization (12, 106). Succession planning as a topic of inquiry, however, is relatively recent in public health, although it has been discussed in generalities since at least the 1990s (92, 106, 107). Wiesman & Baker (106) reiterated the need for and lack of succession planning in 2013, which was validated by two national studies (24, 44). Darnell & Campbell (24) found that ~40% of LHDs were engaged around succession planning activities; Harper et al. (44) found that 93% of SHAs were engaged in some succession planning activities, though the majority of states were not engaged deeply or broadly in this space. On the basis of 2014 and 2017 PH WINS data, estimates indicate that SHA and LHD managers and executives who reported planning to retire by 2023 accounted for ~40% of the total years of experience (~138,000 combined years of experience) of all managers and executives (12). This calculation matters because these individuals possess substantial institutional memory, experience, relationships, and knowledge—all of which are crucial to responding to day-to-day issues—but are perhaps even more important during public health emergencies.

On-the-Job Training

A trained workforce is critical to addressing current and future public health needs, especially when many workers do not have a public health degree. This critical need is observed within the Public Health Accreditation Board's domain, "Build and support a diverse and skilled public health workforce" (84). To achieve the trained and skilled workforce, many health departments rely on outside entities such as TRAIN (<https://www.train.org/main/welcome>) and the National Network of Public Health Institutes (NNPHI; <https://nnphi.org/phln/>) (13). In particular, Regional Public Health Training Centers have been successful in responding to the needs of the workforce within their regions (53), though significant training gaps persist (14).

DISCUSSION

The public health workforce is inarguably the most important component of the public health enterprise (35). However, enumerating this workforce remains problematic. Although thought leaders recognize that the public health workforce is broader than just governmental public health, tracking the workforce across ever-expanding settings has not been accomplished. There seems to be a growing consensus that public health should consider adopting an overarching definition for workers across the collective public health workforce and a consensus-driven taxonomy of relevant occupations and disciplines (11). In addition to enumeration, a number of other issues also perpetuate the vulnerabilities of the public health workforce and ultimately the impact on the public health system as a whole. Despite increased research on and attention to public health and its workforce in the last decade, and especially during the COVID-19 pandemic, some of the key priorities listed in Hilliard & Boulton's 2012 paper remain particularly urgent: diversity; recruitment and retention; and worker supports and protections (46). These items were also discussed in the 2003 Institute of Medicine report (49), as well, in part, in the 1915 Welch–Rose report (104).

Deeper attention to the issue of the diversity of the workforce has resulted in new insights (22), which should be celebrated. However, in the authors' view, next comes the crucial work of ensuring diversity among students in public health programs and supporting these trainees in obtaining fairly compensated jobs within all sectors (e.g., nonprofit, for-profit, and governmental) and at all levels (i.e., local, state, and federal) of public health. Doing so will likely mean addressing and removing some of the hiring barriers discussed throughout this review. It is important to note that some of these hiring barriers are issues of government, not just issues of governmental public health. Some of the challenges that governmental public health hiring managers face are well outside their sphere of control and will require broader reforms in public-sector hiring practices (72). In addition, progress toward public health-specific loan repayment programs is needed and may support diversity and enhanced recruitment efforts in the longer term.

Succession planning and career development plans for governmental public health remain strategies that are not routinely used or thoroughly researched; in fact, there has been an overall lack of research in this area (44, 106). To address this knowledge gap, studies are underway to examine succession planning efforts as detailed in the workforce development plans of accredited health departments. We cannot stop the graying of the workforce, but it is feasible to pass along the experiences of the baby boomers and retain institutional knowledge while adapting to the expectations and norms of future generations of workers. Other fields are doing so, and public health should be no different.

In their seminal work, Hilliard & Boulton (46) allude to the importance of intrinsic motivation to work in public health, a topic examined by several scholars in recent years. This work yields another crucial insight of the body of research on recruitment and retention: that people who are drawn to public health are driven to support the general mission of the field, to promote and protect the well-being of the population. This intrinsic desire to contribute should be celebrated, but the field should treat and compensate its workers fairly and not cling to the expectation of complete selflessness. As such, adequate compensation, robust benefits, and modernized recruiting practices will all be needed to recruit and retain the workforce. Moreover, given the likelihood of increasing disease outbreaks and future global pandemics, this workforce needs further protections and key supports to ensure its sustainability. The COVID-19 pandemic and its related challenges have underscored the importance of worker supports and protections as a foundational component of workforce development efforts (102). Programs aimed at supporting staff directly should be expanded across public health settings. Workforce losses and recruitment issues continue to disproportionately impact rural and more isolated communities, further amplifying the adverse impact on community health (98). Going forward, the safety and well-being of the public health workforce must be a long-term foundational capability embedded into workforce development efforts.

SUMMARY POINTS

1. The public health workforce has contracted substantially since the 1970s, although its mission has changed as well, from primarily the provision of direct clinical services to a more robust mix of population-based prevention, inspection/regulation, and clinical prevention.
2. The aftermath of the Great Recession saw a loss of more than 40,000 public health staff positions in state and local government, most of which did not return; recent growth has been directly related to the COVID-19 pandemic, and whether that growth will be sustained or is sustainable is not clear.

3. Public health enumeration continues to be a challenge as the federal government does not catalog public health agencies or occupations as it does for other fields.
4. Recruitment, diversity, and retention continue to be challenging, especially for specific positions (nursing, epidemiologists, data scientists) and public health–trained young staff, especially URM staff.
5. Although enrollments in public health degree programs have risen, only a small minority of graduates find government employment, perhaps due to labor market competition from the health care sector, comparatively low wages, hiring process complexities, and poor student loan debt to earnings ratios.
6. The COVID-19 response has taken its toll on the workforce, with high reported rates of burnout and symptoms of post-traumatic stress disorder, and has accelerated departures.

FUTURE ISSUES

1. The public health workforce is likely to experience ongoing staff shortages and retirements.
2. Increasing workforce diversity and addressing equity issues are critical to understanding and improving the public health workforce and the served community.
3. Improvements to the academic–practice partnership abilities and recruitment pathways may improve public health workforce recruitment and retention.
4. Loan repayment programs, which exist for other sectors but have not been robustly implemented for all governmental public health staff, are needed.
5. Reforms are needed to the governmental hiring processes and salary structures.
6. Public health worker protections (e.g., salary support, career development, harassment mitigation) are in great need, especially after the COVID-19 pandemic.

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J.P.L. has served as a technical consultant for the following organizations in the previous 36 months: the de Beaumont Foundation, the Public Health Accreditation Board/Public Health National Center for Innovations, the Association of Schools and Programs of Public Health, and NACCHO. V.A.Y. previously consulted for the Public Health Accreditation Board, the Public Health National Center for Innovations, and the de Beaumont Foundation. H.K. has served as a technical consultant for the following organizations in the previous 36 months: ASTHO, the Association of Schools and Programs of Public Health, and Region V Public Health Training Center. B.R. served in 2021 as a technical consultant to ASTHO and NACCHO.

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